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Corn Silage for Sows

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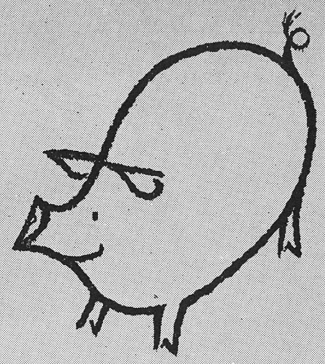

Experiments with more than 2,000 pigs farrowed at Iowa State College show that corn silage—properly supplemented—makes an excellent and low-cost base ration for sows during pre-gestation and gestation.

by C. W. Johnson, V. C. Speer, C. C. Culbertson and D. V. Catron

THE COST of the pork you produce starts with the selection and feeding of your sow herd—long before the pigs are weaned. And savings gained before the pigs are farrowed are fully as real as those you can make after farrowing!

Sows kept in a lean condition but fed rations adequate in energy, protein, vitamins and minerals generally farrow the best litters. Experiments with more than 2,000 pigs farrowed at Iowa State College have shown that corn silage, properly supplemented, makes an excellent low-cost base ration for brood sows during pre-gestation and gestation. In addition, the use of such a ration appears to improve reproductive performance.

Is It Practical?

Our farrowing results for 1955-56 indicate the potential of properly supplemented corn silage as a feed for brood sows.

We hand fed corn silage and a 20-percent protein corn silage balancer to 186 sows and gilts. These sows and gilts farrowed an average litter of 11.3 pigs; only 4.4 percent of the pigs were stillborn, and only 4 of the 186 females farrowed litters of less than 8 pigs.

In 1954 at the same farm, 231 sows and gilts self-fed a complete bulky ration farrowed an average litter of 9.4 pigs; 50 of these females farrowed small litters of 2 to 8 pigs each.

Using 1956 prices we found the calculated feed cost per pig farrowed to be 20 to 30 percent lower for sows hand fed the supplemented corn silage ration than for sows self-fed the bulky ration.

What Quality Silage?

Use only choice-quality corn silage for feeding sows. Sows don't readily eat silage made from corn in the hard dent stage. For the best sow feed, cut the corn while it's still green and, preferably, before frost.

While cattle usually will eat most of any coarsely cut silage, sows tend to sort out the unusually large pieces of stalk and brown corn husk. So, for sow feed with a minimum of waste, the finer the chop the better.

Any type of silo that will keep silage well can be used. If corn silage is used for other classes of livestock, either a temporary or permanent silo should work well. Size, however, will be more important if the silage will be used only for sows.

A sow won't readily eat more than 10 to 12 pounds of corn silage per day. If hogs are your only livestock, the use of silage for sows will be determined either by the number of sows in the herd or by the size of the silo. For a small operation with no other livestock available to make use of silage, it might be worthwhile to consider the use of a large plastic-bag type silo. With herds of 50 sows or more, however, the use of larger conventional silos would be more economical.

How Fed?

You'll find that corn silage can best be fed on a concrete slab or in large troughs. For a trough, allow about 1½ feet of trough side for each sow. Width should be around 18 to 30 inches; depth, 6 to 8 inches. A high lengthwise partition in the middle of a 30-inch-wide trough or a high side on one side of an 18-inch trough will prevent sows from walking across. Crosswise partitions, though not essential, can help overcome the problems of "bossy" sows.

The ideal time to start feeding silage is about 3 to 4 weeks before breeding. This allows time for the sow to get accustomed to the change of feed before breeding time. This makes it possible to flush or full-feed the sow on a well-balanced ration 2 weeks before breeding. To get sows started on corn silage, we suggest "priming" the silage with about 1 pound of shelled corn per head daily. This will encourage the sows to start eating the silage. The corn silage and the "corn silage balancer" may all be fed at one feeding. Thus, it's not necessary to feed more than once a day.

Don't start feeding corn silage right at breeding time. If you

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TABLE 1. Farrowing summary for sows and gilts fed 10-12 pounds of corn silage daily, with balancer fed evenly throughout and with balancer level varied.

	SOWS with balancer system:		GILTS with balancer system:		SOWS AND GILTS with balancer system:	
	Constant[a]	Low-high[b]	Constant[a]	Low-high[b]	Constant[a]	Low-high[b]
No. of litters	29	23	30	30	59	53
Av. litter weight (lbs.)	32.6	35.9	28.4	31.6	30.50	33.75
Av. no. pigs farrowed per litter	11.42	12.83	10.15	11.69	10.79	12.26
Av. pig birth weight (lbs.)	2.86	2.80	2.80	2.71	2.83	2.76
Av. no. live pigs farrowed	10.91	12.16	9.63	11.11	10.27	11.64
Visual classification of pigs farrowed (percent)						
Strong	71.8	65.8	68.8	67.0	70.3	66.4
Medium	8.7	10.9	13.0	15.8	10.8	13.4
Weak	15.0	18.1	13.0	12.2	14.0	15.1
Dead	4.5	5.2	5.2	5.0	4.9	5.1

[a]20-percent protein corn silage balancer fed evenly from breeding to farrowing.
[b]Lower balancer level was fed for first 11 weeks of gestation and was increased for the last one third of gestation.

can't change the feed before breeding, wait until immediately after breeding.

Research has shown that full-feeding a sow starting about 10 days before breeding will increase the number of ova released by the sow—and that reducing the amount of feed to about two-thirds of full feed for several weeks immediately after breeding will increase the percent of ova that survive.

Our own research with the corn silage and 20-percent protein corn silage balancer indicates that a low level of feeding (about 70 percent of full feed) for the first two-thirds of gestation followed by full feed for the last third will increase average litter size by about 1½ pigs (see table 1). This is why we advise making the change to corn silage at least 3 to 4 weeks before or immediately after breeding.

The concentrate ration used with corn silage should be a 20-percent protein "corn silage balancer" to supply nutritional needs not supplied by the silage. We built our own balancer for our experiments.

If you have your concentrate rations custom-mixed, and particularly if your sow herd is relatively large, we recommend using one of the four alternative balancers listed in table 2. Your custom mixer can build one of these concentrates on the basis of the information given in this table.

If your sow herd isn't large enough to justify custom mixing or if you prefer to build your own concentrate, you can approximate the corn silage balancer as follows: Get a high-protein (30-35 percent) brood sow supplement from a reliable feed manufacturer. Adjust the feed to approximately 20-percent protein by adding about an equal amount of ground shelled corn. Since energy is a major consideration, it doesn't seem advisable to use a large percentage of ground oats.

We do, of course, recommend one of the custom-mixed concentrates rather than the "farm-built" approximation whenever your herd is large enough to justify custom mixing. This is because the custom-mixed balancers more precisely meet the nutritional needs not supplied by the corn silage than can the homemade approximation.

To take advantage of the recent findings of research, we suggest that the 20-percent protein corn silage balancer be fed as outlined

TABLE 2. Recommended Alternative *Custom-Mixed* 20-Percent Corn Silage Balancers.

Ingredients	Alternative compositions			
	1	2	3	4
8½% Corn (ground)	702	702	802	852
16% Wheat middlings	300	300	300	400
44% Solvent soybean oilmeal	250	250	250	300
50% Meat and bone scraps	300	300	300	300
32% Condensed fish solubles	50	.....	100	.....
17% Dehydrated alfalfa meal	200	200	200	100
26% Distillers dried solubles	50	100	.....	.....
Defluorinated phosphate (30% Ca, 18% P)	20	20	20	20
Salt (iodized)	20	20	20	20
TRACE MINERAL PREMIX	8	8	8	8
3% Molasses	100	100	.....	.....
VITAMIN PREMIX				
Vitamin D_2, million I.U.	2.0	2.0	2.0	2.0
Riboflavin, grams	4.0	4.0	4.0	4.0
Calcium pantothenate, grams	10.0	10.0	10.0	10.0
Niacin, grams	25.0	25.0	25.0	25.0
Choline chloride, grams	60.0	60.0	60.0	60.0
Vitamin B_{12}, milligrams	20.0	20.0	20.0	20.0
TOTALS (lbs.)	2,000	2,000	2,000	2,000
CALCULATED ANALYSIS				
Protein, %	21.88	21.81	22.24	21.92
Fat, %	3.8	4.0	3.8	3.8
Fiber, %	5.6	5.7	5.7	5.0
Calcium, %	2.04	2.06	1.99	1.92
Phosphorus, %	1.17	1.19	1.17	1.29
Salt, %	1.00	1.00	1.00	1.00
Iodine, %	0.000076			
Vitamin A, I.U./lb.	7,850	7,850	7,900	4,176
Vitamin D_2, I.U./lb.	1,000	1,000	1,000	1,000
Riboflavin, milligrams/lb.	3.89	3.91	3.83	3.26
Pantothenic acid, milligrams/lb.	10.48	10.29	9.93	8.75
Niacin, milligrams/lb.	32.59	30.84	33.79	29.53
Choline, milligrams/lb.	585	585	530	517
Vitamin B_{12}, micrograms/lb.	10	10	10	10

in table 3. Where necessary, the amount of balancer fed can be adjusted up or down slightly to compensate for the amount of corn in the silage and the general condition of the sow.

Along this same line, the sows should be kept lean and not allowed to become fat before breeding or during the first two-thirds of gestation. Three-fourths of the fetal development takes place during the last third of the gestation period. This is the time to increase the level of balancer fed as shown in table 3 to provide ample nutrients for the rapid fetal growth during this period. A total gain during the 16 weeks of gestation of 50-70 pounds for sows and 80-100 pounds for gilts is adequate.

TABLE 3. Recommended Feeding Levels for Corn Silage and Balancer.

Feed once daily all of the corn silage that the sows and gilts will clean up readily. This will be about 10-12 pounds per head daily.

The 20-percent protein corn silage balancer should be fed once daily at the following levels:

	Flushing period	*First two-thirds of gestation*	*Last one-third of gestation*
GILTS	4 to 5 lbs.	3 to 3½ lbs.	4 to 5 lbs.
SOWS	4 to 5 lbs.	2½ to 3 lbs.	4 to 5 lbs.

When starting sows or gilts on corn silage before flushing, feed 1 pound of shelled corn on top of the corn silage for the first 3 days to increase palatability of the silage.

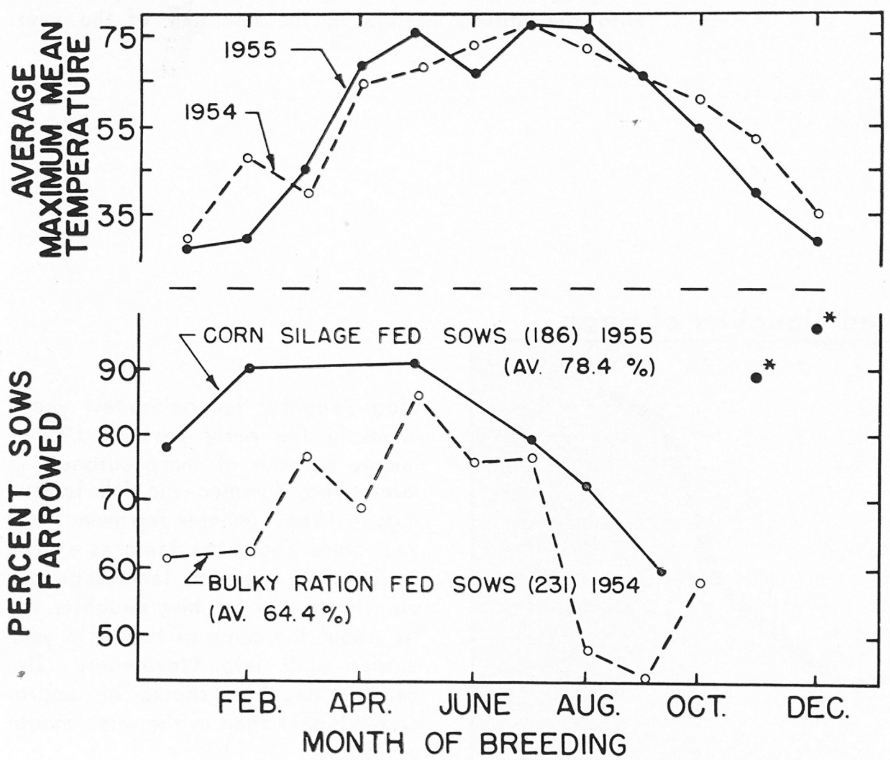
Limitations?

We mentioned earlier that a sow won't readily eat more than 10 to 12 pounds of corn silage per day. If no other livestock are fed, this tends to limit feeding sows corn silage to producers with a sow herd of 50 or more sows. Otherwise, construction and use of a "sow herd size" silo is about the only feasible method; this would represent an added expense and also is in face of the fact that greater relative savings from the practice come as the sow herd becomes larger.

The producer *already using corn silage for other livestock* will find that it pays to use silage for sows also. In this case, there'd be no expense of providing additional ensiling facilities to offset the savings possible by feeding corn silage to relatively small herds.

Multiple-Farrowing . . .

Corn silage works well for large herds where a multiple-farrowing practice is followed. However, there is an additional problem. The heat of the summer seems to reduce the ability of the sow to get-with-pig (see chart). We can't say whether this is the result of the sow or the boar. But, in planning late fall and early winter farrowings, additional sows have to be bred to compensate for the drop in the percentage of sows that will farrow—if you wish to farrow enough litters to keep your equipment filled to capacity. Though the sows in 1955 fed corn silage had a higher conception rate than the 1954 sows, factors other than corn silage also may have contributed to the difference in the two years.



*Points not included in 1955 average.

The effect of season and temperature on the percent of sows that farrowed for the years 1954 and 1955.

Quick Guide . . .

- Start feeding corn silage at least 3 to 4 weeks before *or* immediately after breeding.
- Use only high-quality silage cut short and ensiled while the plant is green.
- For best results, use one of the ration formulas outlined in table 2.
- Feed corn silage as outlined in table 3 (above). With the start of rapid fetal growth—about the eleventh week of gestation—the level of proteins, vitamins, minerals and energy must be increased by increasing the amount of corn silage balancer as indicated.
- Failure to increase the level of corn silage balancer during the last 4 or 5 weeks of gestation may produce undesirable results. A shortage of B-vitamins such as riboflavin, pantothenic acid, niacin and vitamin B_{12} during gestation, for example, may result in hypoglycemia in the baby pigs.